Global Journal of Psychology Research: New Trends and Issues

Volume 13, Issue 1, (2023) 90-103

www.gjpr.eu

The evolvement of behavioral phenomena from matter to life, and from life to mind

Igor Kopsov [a1], TFMC, Jerveien 1324321 Sandnes, Norway. https://orcid.org/0000-0002-6876-917X

Suggested Citation:
Kopsov, I. (2023). The evolvement of behavioral phenomena from matter to life, and from life to mind. *Global Journal of Psychology Research: New Trends and Issues*. *13*(1), 90-103. https://doi.org/10.18844/gjpr.v13i1.8490

Received from January 03, 2023; revised from February 25, 2023; accepted from March 27, 2023;
Selection and peer review under responsibility of Prof. Dr. Tulay Bozkurt, Istanbul Kultur University, Turkey.

Abstract

The paper examines the origins of human behavior and human society. This is done through the lenses of the novel sDAIRA analytical model of human behavior, defining a behavioral act as a sequence of steps: signal(s)-Detection (D)-Appraisal (A)-Intent (I)-Risk analysis(R)-Act (A). A review of components of the sDAIRA model allows us to conceive that human behavior results from an evolutionary evolvement of behavioral phenomena, which initially concern the "functioning of matter," then develop to the "functioning of organisms," and subsequently extend to the "functioning of minds." Consequently, interconnected behavioral models are theorized for different domains of nature, i.e., matter (inanimate matter), life (animate life), and mind (mental phenomena). Furthermore, it is contemplated that society is not a unique attribute of Animalia or humanity but rather a general framework for the existence of all forms of nature. In this way, a material substance represents a community of atoms.

Keywords: Culture; evolution; human behavior; sDAIRA model.

* ADDRESS FOR CORRESPONDENCE: Igor Kopsov, TFMC, Jerveien 1324321 Sandnes, Norway.
E-mail address: ikopsov@gmail.com

1. Introduction

Psychology is the scientific study of mind and behavior (Holt et al., 2019). Psychology scholars have accumulated a vast amount of data describing features and factors of human behavior (Bentley & Lim, 2022). Though first and foremost, behavior is a process (Maestripieri & Boutwell, 2022). Studying any process, e.g., physical, social, or psychological, necessitates developing a schematic that identifies the interconnection between main components and establishes a process model. However, the conceptualization of a model of human behavior receives little attention, thus impeding the progress of psychological studies and preventing their integration with natural and social sciences (Tattersall, 2021).

Another shortcoming of psychological studies and social sciences at large is anthropocentrism (Vaill et al., 2023). Scientists place humans in the center of the universe and exaggerate humankind's role in nature (Rutherford, 2022; Kruger, Fisher & Salmon, 2023). Moreover, they study the surrounding world from a vantage point of bodily, social, and cognitive perspectives, which supplement but, at times, contradict each other. The use of inconsistent methods complicates the rationalization of the world and may lead to a false interpretation of reality. A typical example of such contradiction is a dominating misconception of the interrelation between the mind and culture.

1.1. Purpose of study

This study attempts to present a novel model of human behavior followed by conceptualizing models of the functioning of physical objects and biological organisms.

2. Materials and Method

2.1. Data collection and procedure

This study was qualitative. The study identifies common features of various types of behavior or functioning, from observation and existing literature, and subsequently, postulates a theory of evolvement of behavioral phenomena from matter to life and from life to mind. The emphasis is not on the uniqueness of elements of the universe but on the uniformity of the laws of their functioning. The study challenges the conventional view of society as a unique feature of humankind and Animalia and argues that society is a particular instance of the universal phenomenon of the congregation, which is equally relevant to animate organisms and inanimate matter. The congregation phenomenon applies to all domains of nature, including matter, life, and mind.

Subsequently, the researcher conceives a matrix view of evolution comprising two concurrent processes: the evolvement of elements of nature (i.e., atoms, organisms, and mind) and the evolvement of their congregation forms (i.e., substances, congregations of organisms, culture). By doing so, we resolve some deficiencies of anthropocentrism and bring closer biological, psychological, and social perspectives of research.

2.2. Data analysis

The study is conducted/ through the lenses of the novel sDAIRA analytical model of human behavior, defining a behavioral act as a sequence of steps: signal(s)-Detection (D)-Appraisal (A)-Intent (I)-Risk analysis(R)-Act (A).

2.3. Ethics

This study was ethical. The study posed no harm to the environment, humans, or society. All cited materials were referenced to acknowledge the sources.

3. Results

3.1. The sDAIRA Model of Human Behavior

Different fields of physiology, psychology, and the social sciences have constructed behavioral models with varied degrees of specificity. The S-R (Stimulus-Response) paradigm, developed in the early 20th century, was the pioneering theory of animal and human behavior (Pavlov, 2010; Thorndike, 1898). The paradigm establishes a causal relationship between an action and an internal or external stimulus while considering the organism to be passive and its reaction predetermined. To account for the individual's active participation, the S-R formula was extended to the S-O-R, Stimulus-Organism-Reaction, conception (Woodworth, 1918), in which the organism plays a crucial role in determining its response. The further analytical development of the "organism" element proved difficult for psychology specialists. In contrast, this strategy prospered in practical applications such as management theories, warfare, and decision-making. Several improved models, including the S-O-B-A (Stimulus-Organism- Behavior-Achievement) and S-O-B-C (Situation-Organism-Behavior-Consequences) models, have been presented (Luthans & Davis, 1979). Galperin (1976) established the Model-Clarify-Plan-Control-Action (M-C-P-CA) idea, whereas Boyd (1987) developed the Observe-Orient-Decide-Act (O-O-D-A) loop, which defines a four-step decision cycle. Despite these efforts, the development of a model of human behavior has essentially stalled in psychological studies.

The research views the improvement of the model of human behavior as a prerequisite for the effective advancement of psychology and its long-overdue elevation to "proper science" status. Hereunder, we provide an sDAIRA analytical model of human behavior in which a behavioral act is defined as a series of the following steps: signal(s)-Detection (D) -Appraisal (A) -Intent (I)-Risk assessment (R) -Act (A). It is depicted in Figure 1 (Kopsov, 2021) in the form of a process flowchart. While reflecting the complexity and uniqueness of human behavior, the model:

- Defines a process diagram of the behavioral act,
- Identifies four types of components of the behavioral process: main behavioral act steps, regulating blocks, feedback loops, and transfer functions,
- Replaces the Stimulus-Response formula with the Signal-Response principle,
- Reveals the uncertainty of outcomes of a behavioral act,
- Considers both present ongoing activities as well as future-orientated aspirations,
- Links human behavior to the basic principles of the functioning of physical matter and biological organisms.

The sDAIRA model is based on the further outlined concept of a behavioral act. Physical, physiological, psychological, and social stimuli signals define the environment for the existence of every human being. Before proceeding, signals must be identified (this is the first phase of the behavioral cycle). Due to the limitations of the sensory system, not all signals are noticed; many are overlooked or unrecognized.

Upon detection, a signal must be appraised in terms of its relevance to an individual's life, as not all signals are significant in this context. The fact that an evaluation takes place necessitates a comparison against a set of "criteria." Within our model, such "criteria" are represented by human needs. In the long-term, needs may establish stable patterns, but in momentary perspectives, they form a highly volatile accumulation of distinct needs, wants, and desires – all of which are highly affected by extrinsic (outside environment) and intrinsic circumstances (internal physiological and psychological states).

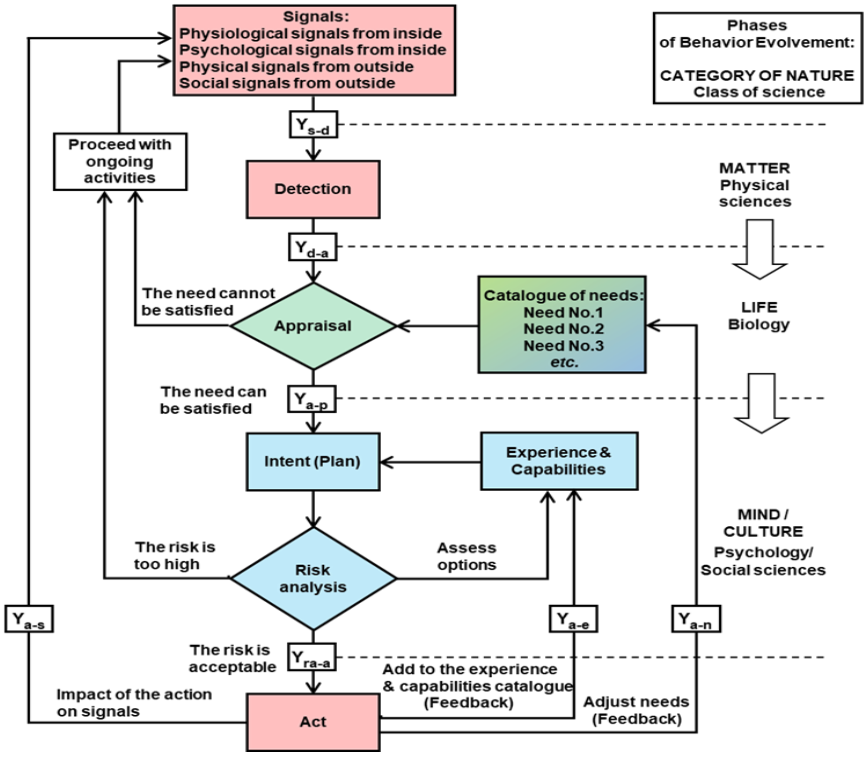
Suppose a person identifies a signal pertinent to meeting a certain need. In this scenario, the signal becomes a stimulus for a behavioral act, and the following phase of the behavioral process can begin, which is to devise an intent (create a plan) for action. Planning necessitates the possession of pertinent knowledge and abilities that enable one to consider a path of action. Consequently, the behavioral model incorporates an *experience & capabilities database*, which gathers and accumulates an individual's knowledge and skills. It consolidates a person's attitudes, conventions, and cultural predispositions as well as contains lessons learned from previously completed actions. Continuous updates and modifications are made to the database of *experience & capabilities* throughout an individual's existence.

A formulated intention does not imply an inevitability of an act. An action plan must be evaluated from a risk perspective, with each individual weighing the possibility of potential gains or losses against the importance of a given goal. If a goal may be accomplished in a variety of ways, the individual may require numerous iterations between the risk analysis and planning phases before determining a course of action. If the prospective advantages are substantial, the risks are manageable, and the predicted energy expenditure is acceptable, the individual proceeds with action implementation (based on the predetermined plan). If risk conditions are not satisfied, a possible action is abandoned.

The sDAIRA model of human behavior (Figure 1) defines the following major phases of the behavioral act: signal(s)-Detection (D)-Appraisal (A)-Intent (I)-Risk assessment(R)-Act (A). *Needs* and the database of *experience & capabilities* are not steps of the behavioral cycle, but they still play a crucial role. Therefore, the research additionally defines s-D-A (N)-I (E)-R-A as a more comprehensive form of the behavioral model. Where *needs* (N) and *experience & capabilities* (E) are denoted in brackets since they are not part of the action sequence but rather provide input during the action's appraisal and intent phases.

Figure 1

The sDAIRA process diagram of human behavior and phases of its evolvement



Source: Kopsov, 2021.

The researcher classifies the behavioral diagram's components into four core types: primary process steps, regulating blocks (Needs, Experience & Capabilities), feedback loops, and transfer functions (denoted by the **Y** symbol in Figure 1). Transfer functions are required because each phase of a behavioral sequence operates according to distinct principles. Information exchange across phases requires a "translator." The transfer function converts the outputs of one system to the inputs of another.

The process diagram (Figure 1) is a dialectical model of human behavior as it incorporates non-linear dynamic interaction between the individual and the environment. The results of a completed action influence triggering signals, update the experience & capacities database and redefine the needs catalog. Therefore, the model contains multiple feedback loops: (1) intent – risk analysis – experience & capabilities – the intent (IREI); (2) experience & capabilities – action – experience & capabilities (EAE); (3) needs – action – needs (NAN); and (4) signal – action – signal (SAS). Feedback loops illustrate the effect of an action on the parameters that caused or influenced it. Human cognitive and emotional states are dynamic because feedback loops constantly alter an individual's psychological state. Consequently, the human psyche is perpetually out of balance, necessitating continuous efforts to maintain human existence.

The model brings to the conclusion that human behavior is inherently reactive, i.e., that humans respond to signals. Consider how a meteorite drifts aimlessly across the sky in response to gravitational forces or how a tree patiently awaits rain to satisfy its water requirement. Humans react similarly to environmental conditions, with the crucial difference being that they can meet their water needs by going to a water source rather than waiting for rain. Humans can plan and bring themselves to situations or locations where desired signals may occur. Hence, the defining feature of human conduct is determined by the ability to select or alter the conditions to encounter the desirable signals.

An important characteristic of the derived process diagram is its capacity to address momentary behavior and as well as to analyze human ambitions and aspirations (Kopsov, 2019). Ambitions and dreams are based on the individual's projected and deferred needs. If needs are deferred and not momentary, the active phase of the behavioral sequence is missing, and the corresponding behavioral cycle concludes with a risk analysis step. Consequently, human desires are modeled by the sDAIR sequence: signal(s)-Detection (D)-Appraisal (A)-Intent (I)-Risk assessment(R).

Previously the research also examined the processes of functioning of groups of various kinds (e.g., project organizations, military units, sports teams), identified their common parameters, and compared them to the process of individual human behavior (Kopsov, 2021). The research concluded that despite some application-specific differences, the operational process is the same for all groups and similar to the generic process of individual behavior (Figure 1). It means that the sDAIRA model applies to the assessment of the behavior of individuals as well as to the functioning of social groups and congregations.

3.2. The Evolvement of Behavior from Matter to Life, from Life to Mind

The universe contains an infinite variety of substances and life forms. It is astounding that scholars have been able to classify atoms, rocks, planets, gases, germs, animals, businesses, nations, and social groupings in an ordered fashion. Many generations of researchers labored to define each of the world's distinct components. The amassed information is so enormous that a single person can't comprehend the universe in its entirety.

Further, the research posits a different view of the world and asserts that, despite its immense diversity, everything in the universe operates according to the same set of rules.

Where the conventional approach identifies an unending combination of variety, the research seeks uniformity. The research replaces the diversity of attributes for the consistency of procedures. From our perspective, the world is uniform, and all events are governed by the same principles that apply to the behavior of atoms, microbes, mammals, plants, humans, social organizations, etc. It should be noted that multiple parallels exist between this conception and Whitehead's (1985) "process philosophy," which views existence as a series of "acts of becoming" as opposed to "acts of being." Process philosophy examines the elements of the universe's constituents through the lens of their dynamic interactions with their surrounding environment rather than through the lens of their distinct, static features.

At the basis of our vision of the world is recognizing that behavior is a universal phenomenon, not a characteristic peculiar to animals and humans (Henriques, 2011). From this vantage point, reactions between chemicals, tree hibernation, and a lion pursuing prey are all examples of behavior. The complexity of these acts distinguishes them from one another, while their fundamental nature remains the same.

The research believes that human conduct is the product of an evolutionary process of the development of behavioral phenomena, which initially pertain to the "functioning of matter," then move to the "functioning of organisms," and finally cover the "functioning of minds." Correspondingly, the researcher (Kopsov, 2020) has created models of the functionality of physical substances and living beings following the method previously used to describe human behavior, as represented in Figure 1. The result was a set of behavioral models for several levels of behavioral complexity, including matter (inanimate matter), life (animate life), and consciousness (mental phenomena).

The research theorizes that the sDA model, signal(s)-Detect (D)-Action (A), characterizes the behavior of inanimate matter (Figure 2a). According to this model, the functionality of inanimate matter is determined by its qualities, represented by the behavioral model's detect (D) component. This component defines the type and intensity of signals that affect the existence of an inanimate object. Then, the sDAA model characterizes the behavior of living organisms, i.e., signal(s)- Detect(D)- Appraise(A)-Act(A), as it accounts for the impact of needs (Figure 2b). The detect (D) phase is also in place for animate life, such as plants. However, the appraisal (A) phase is the primary part of the behavioral process. It assesses signals against the needs and defines an organism's reaction.

Consequently, human functioning is defined by the sDAIRA model, which includes the intent (I) and risk analysis (R) steps. It is the most sophisticated behavioral process, superseding the functional principles of inanimate objects and living organisms. To show the primary phases of the evolution of the behavioral process (Figure 1), the research color-coded its components to link their origin to the emergence of matter (red), life (green), and mind (blue) (blue).

The research hypothesizes that each domain of nature relates to a distinct component of the behavioral schematic (Figures 1, 2). For inanimate matter, the detect (D) stage, which exemplifies the material qualities, is the governing parameter of the behavioral act. The crucial stage for the functioning of living organisms is the appraisal (A) of signals. This stage represents the capacity of living organisms to develop a variety of complicated, predetermined reactions to a diversity of environmental conditions. Finally, mental phenomena are exemplified by the intent (I) and risk analysis (R) stages, which dominate human behavior.

The theory of the evolvement of the behavioral phenomenon sheds new light on the question, "Why do we sometimes have a sense of connection with other kinds of life or inanimate objects?" The obvious answer is that these organisms, beings, and objects define our environments, and we become used to them. However, there is an additional type of relationship. Munch (n. d), the renowned painter of "The Scream," stated in his notes that "the

hard mass of the stone is also alive." This remark is not a theoretical hypothesis but rather the personal reflection of an artist who is profoundly absorbed in his emotions and the universe's richness. Indeed, rocks, plants, animals, and humans are all parts of the universal evolvement process. They all exist according to a single set of principles and function according to similar behavioral standards. The diversity is only due to the complexity of their arrangements, and this diversity is not as significant as it may seem.

Some scientists strongly support Munch's view of the universe. Renowned mathematician and philosopher Whitehead (1985) emphasized that perception is not merely a quality of living creatures but also an attribute of unconscious matter and contended that perception is the core of life. According to Whitehead, the stony mass is perceptive and, hence living. The way a rock feels is far different from that of a human.

One may begin to picture how we are attracted to the objects and creatures around us not just because they are part of our ecosystems but also because we are similar to them and create a single universal unity. According to proponents of panpsychism, even the phenomenon of consciousness may not be specific to the brain but rather a property inherent to all matter. In this context, "consciousness" is not synonymous with self-awareness; instead, it refers to the capacity to experience pleasure, pain, and various types of perception (Goff, 2019).

Humans have trouble interacting with people who speak other languages, and except for specific basic approaches, we've also lost the ability for meaningful engagement with animals. The fact that people perceive a sense of disconnection from rocks and trees does not mean there are no ties between us; perhaps we lack the means of communication.

The concept of the interrelationship between the principles of the functioning of matter, life, and mind is not new. Numerous scientists have pointed to the connection between life and mind by highlighting that human "capabilities of understanding... are rooted in the structures of our biological embodiment" (Varela et al., 1991). According to proponents of the free energy principle (Kirchhoff & Froese, 2017; Bruineberg et al., 2018), life and the mind share the same fundamental organizational features. Similarities have also been observed between living and non-living systems. For example, a striking resemblance between the network of neuronal cells in the human brain and the network of galaxies in the universe. Such closeness shows that the self-organization of both systems is likely being shaped by similar principles of network dynamics. This is despite the vastly different nature of these phenomena (Vazza & Feletti, 2020).

Research by Volkov et al. (2009) reveals that certain plant species have short-term memory, an intelligence trait. According to a new study, fungi (mushrooms) may also demonstrate symptoms of intelligence because they can communicate through subterranean connections called hyphae - similar to how nerve cells transfer information in humans (Adamatzky, 2022). Examination of the electrical impulses fungus purportedly convey to one another has revealed some unique patterns in such communications.

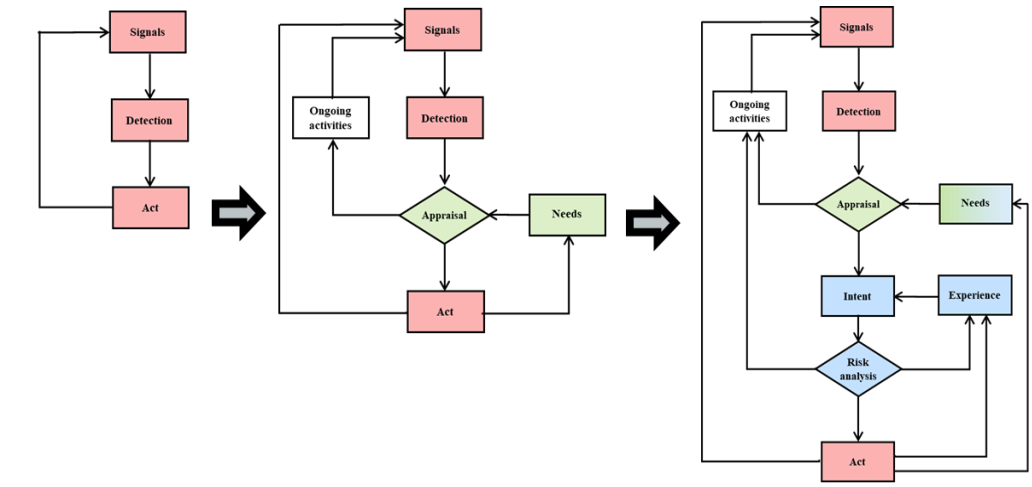
The aforementioned research (Adamatzky, 2022; Vazza & Feletti, 2020; Volkov et al., 2009) indicates that live beings, non-living matter, and consciousness have much more in common than traditionally recognized. These investigations represent a transition from theorization to the experimental study of the links between different domains of nature. Possible intelligence indicators in biological creatures may show that the sDAA animate life behavioral model is more nuanced than first anticipated. Such a finding would not negate the fundamental implications of our hypothesis. Nonetheless, it may result in the acknowledgment of rudimentary intellect and active perception in the lower domains of nature. In this situation, while keeping the core framework of derived postulates, it would be more appropriate to refer to the "dominant" or "prevailing" behavioral processes instead of the strict phasing of behavioral schematics. Cases of rudimentary intelligence in biological organisms may reflect

transitional stages in the evolution of behavior from the functioning of life to the functioning of the mind (Hay et al., 2022). In the same way as transitional fossils (Freeman & Scott, 2004) constitute proof of Darwin's theory of evolution, transitional behavioral patterns can be evidence of our hypothesis of the development of behavioral phenomena.

The essential premise of our theory is that matter, life, and mind are interconnected by the common principles of functionality, which can be characterized by a single generic process configured differently for different levels of complexity. The human behavior process diagram (Figure 1) depicts the most complex kind of behavior. The algorithms that correspond to the functioning of matter and life are simpler versions. A comparison of the three process diagrams (matter, life, and mind) offers a unique perspective on evolution from the physical to the biological to the psychological dimensions (Figure 2). It permits the identification of functional characteristics shared by physical objects, living organisms, and animals/humans. All process diagrams are primarily founded on the Signal-Response concept, beginning with a signal and concluding with an action. All schematics have a feedback loop defining an action's reverse effect on the signal that triggered it. The introduction of additional operational process components can be viewed through the prism of subsequent phases of evolution.

Figure 2

The evolvement of behavioral processes: from Matter to Life, from Life to Mind.



Behavioral processes evolve because of the introduction of new steps and feedback loops. Throughout this progression, higher-complexity functional features do not invalidate previous behavioral principles but rather supersede and incorporate them. The processes of biological nature are derived from the behavior of physical matter via the addition of needs and need appraisal functions. In turn, psychological processes evolve from biological behavior by adding intent, risk analysis, and experience accumulation functions. Each level of complexity is associated with the emergence of particular behavioral process components through this evolution. As an outcome of described transformations, the immediate and predetermined reaction of physical objects paves the way to humans' long-term oriented and varied responses.

The increasing domination of future-oriented behavior characterizes all evolutionary changes. The fleeting existence of physical objects contains no awareness of the future. Biological organisms demonstrate some future-orientated behavior through genetic mechanisms while focusing predominantly on present objectives. Human lives are primarily

focused on reaching future-oriented goals. The rising future orientation of activities is a defining feature of the evolution of behavioral phenomena and one of its driving forces. The free energy principle stipulates that any systems prolong its existence by minimizing the "surprise" factor, which is the discrepancy between a system's model of the world and its actual perception of reality (Friston, 2010). The future orientation of behavior seeks to avoid surprises; for instance, in the process diagram of human behavior (Figure 1), this is exemplified through risk analysis, planning, experience accumulation, and reconfiguration of needs.

The evolutionary trend towards the future orientation of behavior occurs alongside the enhancement of information processing and storage capabilities. In a familiar pattern, lower-level information processing becomes integrated into more advanced and complex systems (Henriques, 2011). The phenomenon of information emerges in the material matter – as the atomic arrangement by itself represents a record of information. While absorbing inanimate nature properties, biological organisms acquire a more advanced genetic information feature. Animals and humans capitalize on the genetic system and develop the psyche and mind enabled by neuronal information processing. It is plausible to argue that each domain of complexity is enabled through the emergence of specific modules of the behavioral process diagram and associated information processing type.

The "detect" module in the behavioral schematic of physical objects is related to the arrangement of subatomic particles. It represents core material properties and an atomic means of information storage. The emergence of the "appraise" function correlates with the formation of biological organisms and genetic information encoding. Intent and risk assessment modules enable the psyche and mind, which is achieved through neuronal information handling.

3.3. A Matrix Model of Evolvement of the Universe

It is general knowledge that atoms make substances, trees form forests, individuals form groups, etc. This is how we are accustomed to seeing the world, and we cannot picture it any other way. However, evolution could have selected a different path; the cosmos may have been made up of distinct, unconnected components, such as detached atoms, isolated trees, and solitary individuals. Therefore, we hypothesize that a solitary existence is an exception to the law of congregation, one of the fundamental laws of the cosmos, according to which everything seeks "unity" and congregation. Components of the universe seek cohesion, as cohesion promotes stability and energy conservation. Atoms congregate into substances, beings congregate into communities of organisms, and minds congregate into cultures.

These are not insignificant considerations. Some of the conventional paradigms of psychology and the social sciences can be questioned if the phenomenon of the congregation is appropriately understood. For instance, we challenge the notion that culture/society is a distinct domain of nature superior to that of minds/humans (Henriques, 2011). The research disagrees with this view and instead suggests that culture is not on a higher domain superseding the mind, but it is united with it. The research contends that the mind and culture are inextricably linked.

The similarity of individual and group behavior processes leads to the conclusion that the human mind/psyche and culture belong to the same level of complexity of nature. This idea contradicts the widely accepted belief that society/culture is an independent category of reality that supersedes the mind. In our previous work (Kopsov, 2021), the research demonstrated that in the generally perceived progression of the evolvement of the levels of complexity of nature matter-life-mind-culture, the latter transition (mind to culture) could not be authenticated.

There are additional arguments supporting this point of view, as it is plausible to reason that the functioning of mind and culture are conjoined, whereby one cannot exist without the other. The mind cannot sustain its existence outside the social domain, which may appear

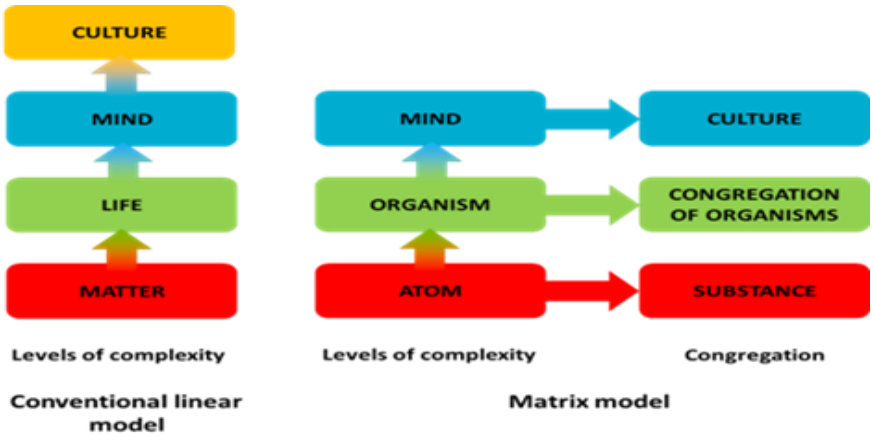
counterintuitive, as individuals can technically survive outside society, but this could be feasible for only a single generation. The mind can maintain a short-term isolated existence but will go extinct without social interactions. Hence, one can conclude that the mind does not exist without society/culture, and society/culture cannot exist without the mind.

Umberto Eco, an Italian philosopher, and author echoed our view by claiming that every cultural experience is a form of communication between individuals (Caesar, 1999). Lotman (1990) identified the primary roles of culture as fighting entropy, retaining information, and promoting interpersonal contact. In this way, the main function of culture is to cater to the existence of human minds. This argument is not limited to a particular taxonomy of natural domains. An alternative to the description of stages of nature as matter-life-mind-society would be the following classification: subatomic particles, atoms, molecules, cells, organic structures, multicell organisms, consciousness, and society. This classification and most other classifications of the basic domains of nature include a separation between mind and consciousness on one side and culture, society, and civilization on the other. The research contends that such classifications are erroneous and that the mind and culture are fully interconnected. They cannot exist independently, and the same functional principles control their functioning. Culture does not supervene minds but rather unites them and is representative of the phenomenon of the congregation of minds.

Matter, life, and mind follow different behavioral principles. Matter can and does exist without life (biological organisms), and life can exist without the mind. Therefore, matter, life, and mind are separate domains of nature, while culture is not. The researcher believes that society is not a characteristic specific to Animalia or humankind but rather a framework for the existence of all forms of nature. According to the law of congregation, the basic components of nature, i.e., atoms, organisms, and individual minds, do not exist autonomously but generate congregations, i.e., substances, communities of organisms, and cultures. In this manner, a material substance is an atomic community. Individual living organisms develop their communities, i.e., communities of organisms, forming the biological realm of the world. Similarly, individual minds accumulate to form cultures. In the context of cosmogenesis, social phenomena progress from material matter to a community of organisms and subsequently to cultural formations.

Figure 3

The evolvement of levels of complexity and congregations. Conventional linear and revised matrix models



This approach (Figure 3) represents domains of nature not as a conventional linear progression of matter-life-mind-culture but as a two-dimensional matrix of individual elements (atom-organism- mind) and their aggregations (substances-communities of organism-culture).

Humankind is a combination of two social phenomena: a congregation of organisms and a congregation of minds.

The research argues that psychology's contribution to the analysis of social dynamics is woefully underappreciated. From the perspective of the universality of the congregation phenomenon, examining society separately from the human mind and psyche equates to studying material substances while ignoring their atomic composition. Even though such an approach may still be plausible and even carry some benefits, disregarding atomic properties in the analysis of materials would remain a grave error given the current state of knowledge. Analogously, social sciences such as sociology or political studies must integrate analyses of the human psyche to become a truly comprehensive research field. Continued concealment of the interrelationships between the mind and society impedes the identification of the psychological drivers of social phenomena.

The apparent distinction between sociology science and psychology is not well-founded. The research argues that political and social events arise essentially inside the realm of human psychology. Human psychology contributes to important and intricate social phenomena such as ethical theories, generational conflicts, civilizational confrontations, and social revolutions and defines them. The research believes that additional research into the struggle for cognitive informational dominance and cognitive informational collaboration will advance our understanding of the psychological drivers of social processes from contemporary and historical standpoints.

3.4. Fundamental characteristics of Matter, Life, and Mind

Henriques (2003; 2011) proposes that all categories of nature are characterized by shared fundamental phenomena such as information processing and behavior. The research elaborates on this by suggesting that the fundamental phenomena also include a congregate class. Hence, for each category of nature, a set of shared essential characteristics includes behavior and an associated governing function of the behavioral process (ref. Figures 1, 2), a governing information processing type, and a congregation class, as presented in Table 1.

Table 1

Fundamental characteristics of categories of nature.

	Fundamental characteristics of categories of nature			
Category of nature	**Basic component**	**Governing behavioral function**	**Governing information processing type**	**Congregation class**
Matter	Atom	Detection	Anatomic arrangement	Substance
Life	Organism	Assessment	Genetic encoding	Congregation of organisms
Mind	Individual mind	Intent and Risk analysis	Neuronal processing	Culture

It should be précised that the fundamental characteristics presented in Table 1 are governing rather than exclusive. For the matter, the governing function of the behavior is the detection of signals exhibited through material properties; information is preserved through atomic arrangements; material substances exemplify the congregation. For living organisms, behavior is governed by the function of assessment of signals against predefined needs; the governing type of information processing is genetic encoding; and communities of organisms represent the congregation. For the mind, behavior is primarily affected by planning and risk analysis activities; the governing type of information processing is neuronal processing; the congregation is represented by culture.

Table 1 summarizes the governing principles that define the universe as we know it - the laws of the congregation and behavior. The law of congregation establishes the form of existence, and the law of behavior defines the process of existence. The primary laws address the core metaphysical questions – how we are organized and function. These main universal principles subsequently diverge into more specific doctrines defining the existence of matter, life, and mind.

It is most plausible that evolution is an ongoing process and that humankind and nature, in general, continue to evolve (Korotayev, 2018; Kurzweil, 2005). Thus far, identifying common trends in the evolvement of behavioral principles has allowed us to hypothesize the evolutionary flow between the dimensions of reality (i.e., matter, life, and cognitive mind). This common trend can also provide a view of potential directions of future evolution. Through forwards extrapolation of defined common traits, it may be proposed that the behavioral principles will continue to evolve, and their complexity will increase through the following alterations:

- Addition of new behavioral process steps,
- Addition of new behavioral process feedback loops,
- Increasing future-orientation,
- Addition of new information processing methods, and
- The emergence of new types of the congregation.

These changes may result in the emergence of new levels of complexity in nature.

The outlined tendencies of the evolution of behavioral phenomena are also applied retroactively. The algorithm for functioning physical bodies is the most elementary of the discussed behavioral processes. Nonetheless, it is characterized by a degree of complexity as it relies on signal recognition and implies information recording via atomic arrangement. These characteristics indicate variances in substances and their properties. It might be argued that a more fundamental form of the algorithm exists, depicting a state with limited or no variation in a material's nature and signifying a completely homogenous state of matter inside a highly unified field of stimuli. Such matter may operate by the authentic Signal-Response algorithm consisting of "signal" and "action" phases.

4. Conclusion

The research started with an attempt to apply the basic principles of analytical modeling to psychology by conceptualizing an sDAIRA model of behavior. According to it, a behavioral act consists of a sequence of steps occurring in response to the physical, physiological, psychological, and social type of signals: signal detection(D)-appraisal(A)-the intent(I)-risk analysis(R)-act(A). The derived model proved to be a powerful tool that led to the subsequent development of a theory of human happiness, the conceptualization of a dynamic model of human needs, and unified psychology. Eventually, it became evident that issues concerning psychology must be considered together with the matters of philosophy and metaphysics.

Accordingly, the research approached behavior and society not as unique features of human living but as fundamental attributes of the universe. The research hypothesized that the human psyche evolved as a result of a transition of acts of inanimate matter to the functioning of life and then to the operation of the mind. This transformation occurred through the enhancement of the shared principles of behavior. Further, we applied similar reasoning to the phenomenon of the congregation and theorized that it developed from material substance to the congregation of organisms and then to culture, i.e., a community of minds.

The research conceives a matrix view of evolution comprising two concurrent processes: the evolvement of elements of nature (i.e., atoms, organisms, and mind) and the evolvement of their congregation forms (i.e., substances, congregations of organisms, culture).

References

Adamatzky, A. (2022). Language of fungi derived from their electrical spiking activity. *Royal Society Open Science*, *9*(4), 211926. https://royalsocietypublishing.org/doi/abs/10.1098/rsos.211926

Bentley, P. J., & Lim, S. L. (2022). From evolutionary ecosystem simulations to computational models of human behavior. *Wiley Interdisciplinary Reviews: Cognitive Science*, 13(6), e1622. https://wires.onlinelibrary.wiley.com/doi/abs/10.1002/wcs.1622

Boyd, J.R. (1987). Destruction and Creation. U.S. Army Command and General Staff College.

Bruineberg, J., Kiverstein, J., Rietveld, E. (2018) The anticipating brain is not a scientist: The free-energy principle from an ecological-enactive perspective. *Synthese*. 195, 2417–2444. https://doi.org/10.1007/s11229-016-1239-1

Caesar, M. (1999). *Umberto Eco: Philosophy, Semiotics, and the Work of Fiction.* Wiley-Blackwell. p. 55. ISBN 978-0-7456-0850-1.

Freeman, S., Herron, J.C. (2004). *Evolutionary Analysis* (3rd ed.). Upper Saddle River, NJ: Pearson Education. ISBN 978-0-13-101859-4. LCCN 2003054833. OCLC

Friston, K.J. (2010). The free-energy principle: a unified brain theory? *Nature Reviews, Neuroscience*, 11(2):127-38. https://www.nature.com/articles/nrn2787

Galperin, P.J. (1976). *Introduction to psychology*. Moscow, Russian ed.

Goff, P. (2019). *Galileo's Error: Foundations for a New Science of Consciousness*. Vintage, Pantheon. ISBN 0525564772.).

Hay, R., Cullen, B., Graham, N., Lyall, D. M., Aman, A., Pell, J. P., ... & Strawbridge, R. J. (2022). Genetic analysis of the PCSK9 locus in psychological, psychiatric, metabolic and cardiovascular traits in UK Biobank. *European Journal of Human Genetics*, 1-11. https://doi.org/10.1038/s41431-022-01107-9

Henriques, G. (2003). The Tree of Knowledge System and the Theoretical Unification of Psychology. *Review of General Psychology*, 7(2):150-182. https://journals.sagepub.com/doi/pdf/10.1037/1089-2680.7.2.150

Henriques, G. (2011). *A new unified theory of psychology*. New York: Springer. https://link.springer.com/book/10.1007/978-1-4614-0058-5

Holt, N., Bremner, A., Sutherland, E., Vliek, M., Passer, M., & Smith, R. (2019). *EBOOK: Psychology: The Science of Mind and Behaviour, 4e*. McGraw Hill.

Kirchhoff, M., Froese, T. (2017). Where there is life there is mind: In support of a strong life-mind continuity thesis. *Entropy*, 19(4). https://www.mdpi.com/191658

Kopsov, I. (2019). A new model of subjective well-being. *The Open Psychology Journal*, 12(1):102-115. https://journalspress.com/LJRS_Volume19/701_A-New-Model-of-Human-Needs.pdf

Kopsov, I. (2020). On the origin of human behavior. *Sage Submissions.* Preprint. https://doi.org/10.31124/advance.12151791.v1

Kopsov, I. (2021). Comparison of algorithms of individual and group behavior. *Advances in Social Sciences Research Journal* 8(2):487-510 https://tinyurl.com/mrx65uuf

Korotayev, A. (2018). The 21st Century Singularity and its Big History Implications: A re-analysis. *Journal of Big History* 2(3): 74-120. https://jbh.journals.villanova.edu/article/view/2329

Kruger, D. J., Fisher, M. L., & Salmon, C. (2023). What do evolutionary researchers believe about human psychology and behavior? *Evolution and Human Behavior*, 44(1), 11-18. https://www.sciencedirect.com/science/article/pii/S1090513822000836

Kurzweil, R. (2005). *The singularity is near: When humans transcend biology*. New York: Penguin.

Lotman, Y. M. (1990). Universe of the Mind. *A semiotic theory of culture*, 20-35. http://ftp.columbia.edu/itc/architecture/ockman/pdfs/Lotman.pdf

Luthans, F., & Davis, T. (1979). Behavioral self-management—The missing link in managerial effectiveness. *Organizational Dynamics*, 8(1):42-60. https://www.sciencedirect.com/science/article/pii/0090261679900032

Maestripieri, D., & Boutwell, B. B. (2022). Human nature and personality variation: Reconnecting evolutionary psychology with the science of individual differences. *Neuroscience & Biobehavioral Reviews*, 104946. https://www.sciencedirect.com/science/article/pii/S0149763422004353

Munch E. (n.d.). Munchmuseet, MM t 2547. eMunch.no | Hybridvisning | MM T 2547. Skissebok. "Kunnskapens træ". https://emunch.no/HYBRIDNo-MM_T2547.xhtml

Pavlov, I. (2010). Conditioned reflexes: An investigation of the physiological activity of the cerebral cortex. *Annals of neurosciences*, 17(3):136–141. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4116985/

Rutherford, A. (2022). *Human Origins.* In E. Ward & R. Reuvers (Eds.), Enigmas (Darwin College Lectures, pp. 10-39). Cambridge: Cambridge University Press. doi:10.1017/9781009232517.002

Tattersall, I. (2021). Evolution of human behaviour and societies. *Antiquity,* 95(382), 1088-1090. https://www.cambridge.org/core/journals/antiquity/article/evolution-of-human-behaviour-and-societies/6EB97A64DD43135ED04F70C14CB331EA

Thorndike, E. (1898). Animal Intelligence: An Experimental Study of the Associative Processes in Animals. *Psychological Review*, 5(5):551-553. https://psycnet.apa.org/journals/mon/2/4/i/

Vaill, M., Kawanishi, K., Varki, N., Gagneux, P., & Varki, A. (2023). Comparative Physiological Anthropogeny: Exploring Molecular Underpinnings of Distinctly Human Phenotypes. *Physiological Reviews*. https://journals.physiology.org/doi/abs/10.1152/physrev.00040.2021

Varela, F. J., Thompson, E., & Rosch, E. (1991). *The embodied mind: Cognitive science and human experience*, MIT Press.

Vazza, F. & Feletti, A. (2020). The Quantitative Comparison Between the Neuronal Network and the Cosmic Web. *Front. Phys.* 8:525731. https://www.frontiersin.org/articles/10.3389/fphy.2020.525731/full?trk=public_post_comment-text

Volkov, A. G., Carrell, H., Baldwin, A., Markin, V. S. (2009). Electrical memory in Venus flytrap. *Bioelectrochemistry*. 75 (2): 142–147. https://www.sciencedirect.com/science/article/pii/S1567539409000668

Whitehead, A.N. (1985) *Symbolism: It's Meaning and Effect*, New York: Fordham University Press.

Woodworth, R.S. (1918). *Dynamic Psychology*. Columbia University Press.